

- 1 What is claimed is:
- 2 1. A method for making bumps on a wafer, comprising the steps of:
- 3 providing a wafer with an active surface having a plurality of bonding pads thereon;
- 4 forming an UBM (Under Bump Metallurgy) layer over the active surface of the wafer
- 5 to connect the bonding pads;
- 6 forming a photoresist layer on the UBM layer;
- 7 creating a plurality of openings in the photoresist layer in locations corresponding to
- 8 the bonding pads of the wafer;
- 9 forming a liquid photoresist in the openings of the photoresist layer;
- 10 exposing and developing the liquid photoresist for modifying the openings of the
- 11 photoresist layer;
- 12 forming a plurality of bumps in the openings in photoresist layer, the bumps being
- 13 bonded onto the UBM layer;
- 14 removing the photoresist layer and the liquid photoresist;
- 15 etching the UBM layer to form a plurality of UBM pads under the bumps, using the
- 16 bumps as a mask; and
- 17 reflowing the bumps on the UBM pads.
- 18 2. The method in accordance with claim 1, wherein the openings has at least a reentrant
- 19 portion.
- 20 3. The method in accordance with claim 2, wherein the liquid photoresist is filled in the
- 21 reentrant portion of the openings after the exposing and developing step of the liquid
- 22 photoresist.
- 23 4. The method in accordance with claim 1, wherein the liquid photoresist is positive
- 24 type.
- 25 5. The method in accordance with claim 4, wherein the photoresist layer is negative
- 26 type.
- 27 6. The method in accordance with claim 4, wherein the liquid photoresist is patterned by

- 1 using the photoresist layer as a mask.
- 2 7. The method in accordance with claim 1, wherein the photoresist layer is a dry film
3 layer formed by attaching method.
- 4 8. The method in accordance with claim 1, wherein the thickness of the photoresist layer
5 is between 3~6 mil.
- 6 9. The method in accordance with claim 1, wherein the UBM layer is etched by plasma
7 etching method.
- 8 10. A method for making bumps on a wafer comprising the steps of:
9 providing a wafer with an active surface having a plurality of bonding pads thereon;
10 forming an UBM (Under Bump Metallurgy) layer over the active surface of the wafer
11 to connect the bonding pads;
12 forming a photoresist layer on the UBM layer;
13 creating a plurality of openings in the photoresist layer in locations corresponding to
14 the bonding pads of the wafer;
15 forming a liquid photoresist in the openings of the photoresist layer;
16 exposing and developing the liquid photoresist for modifying the openings of the
17 photoresist layer;
18 forming a plurality of bumps in the openings in the photoresist layer, the bumps being
19 bonded onto the UBM layer;
20 removing the bump photoresist layer and the liquid photoresist; and
21 etching the UBM layer to form a plurality of UBM pads under the bumps, using the
22 bumps as a mask.
- 23 11. The method in accordance with claim 10, wherein the openings has at least a
24 reentrant portion.
- 25 12. The method in accordance with claim 11, wherein the liquid photoresist is positive
26 type.
- 27 13. The method in accordance with claim 12, wherein the liquid photoresist is patterned

1 by using the photoresist layer as a mask so as to be filled in the reentrant portion of
2 the openings.

3 14. The method in accordance with claim 12, wherein the photoresist layer is negative
4 type.

5 15. A method for making a bump comprising the steps of:

6 providing a substrate with a surface;

7 forming a metal layer over the surface of the substrate;

8 forming a first photoresist on the metal layer;

9 creating an opening in the first photoresist layer, the opening having a reentrant
10 portion;

11 forming a second photoresist in the opening and the reentrant portion of the first
12 photoresist;

13 exposing and developing the second photoresist for modifying the openings of the
14 first photoresist;

15 forming a bump in the modified opening in the first photoresist, the bump being
16 bonded onto the metal layer;

17 removing the first photoresist and the second photoresist; and

18 etching the metal layer to form a pad under the bump, using the bump as a mask.

19 16. The method in accordance with claim 15, wherein the second photoresist is positive
20 type.

21 17. The method in accordance with claim 16, wherein the second photoresist is patterned
22 by using the first photoresist as a mask so as to be filled in the reentrant portion of the
23 opening.

24 18. The method in accordance with claim 16, wherein the first photoresist is negative
25 type.

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